(No Model.)

T. D. BOTTOME.

INCANDESCENT LAMP CUT-OUT.

No. 458,653. Patented Sept. 1, 1891.

Fig. 2.

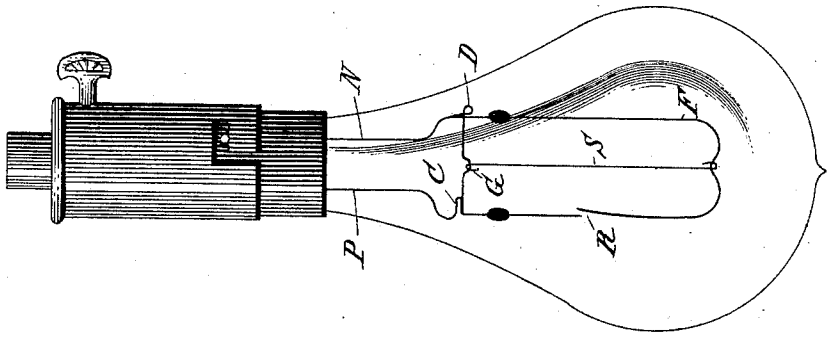


Fig 3.

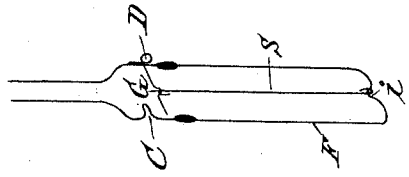
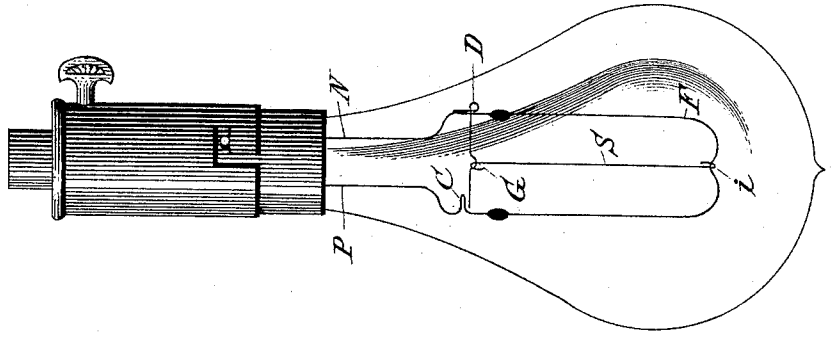


Fig. 1.



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TURNER D. BOTTOME, OF HOOSICK, NEW YORK.

INCANDESCENT-LAMP CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 458,653, dated September 1, 1891.

Application filed March 16, 1891. Serial No. 385,302. (No model.)

To all whom it may concern:

Be it known that I, TURNER D. BOTTOME, a citizen of the United States, and a resident of Hoosick, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Incandescent-Lamp Cut-Outs, of which the following is a specification.

This invention relates to an automatic method of cutting out ruptured incandescent electric lamps from series circuits; and it consists, essentially, in the manner of constructing a spring contact-piece attached to one of the leading-in wires of the lamp, whereby the said contact-piece is normally kept separated from the other leading-in wire by the opposing mechanical resistance offered by the filament. Heretofore lamps of this class, when connected in series with one another, have generally been provided with mechanical or magnetic devices located externally to the lamp for the purpose of automatically maintaining a closed circuit; but such devices, although they answer the purpose, are expensive, and when least expected they are apt to get out of order and fail to work, thus allowing the circuit to be broken, resulting in total extinguishment of all the lamps located on that circuit. Certain internal cut-outs have also been devised and patented in which the terminals of the lamp were placed closely together, but separated by a thin stratum of either some high-resistance conducting mass or by a non-conducting body, such as mica. In either case the operation of the cut-out depends principally on an arc being formed, which usually cuts out the filament from the circuit by reason of the leading-in wires becoming fused together through the action of the arc formed. It is obvious that a cut-out of the above description can only act properly when sufficient potential is in the circuit to overcome the resistance of the interposed body between the lamp terminals, as without sufficient electro-motive force an arc cannot form; hence the cut-out fails to act; and, again, most cut-outs are not adapted to operate with both a continuous and alternating current. This is especially true of the magnetic forms.

The object of the present invention is to overcome the inherent defects of the usual forms of automatic cut-outs and to provide one that is absolutely certain in its action, whether but one or a great number of lamps are in the circuit, yet being of simple construction, cheaply made, and readily applied to the usual forms of filaments in lamps of this class, and at the same time one that will operate equally well with a continuous or alternating current.

I attain my object in a practical way in the manner shown by the accompanying drawings, which form a part of this specification, and reference may be had thereto.

In the drawings, Figure 1 shows a lamp complete and in working order with the cut-out ready for action. Fig. 2 is a lamp complete with the filament ruptured and cut out of the circuit. The rupture is shown at R and the spring D in contact with the bend C. Fig. 3 shows an end view of the arrangement of the contact-point C and the spring D.

In Fig. 1, F represents the filament; P and N, the leading-in wires; S, the support-wire for holding the spring D out of contact from the bend C in the terminal wire P. The support-wire is fastened at one end to the filament by a small piece of carbon, which may form a part of the filament, or the filament may be formed with an indent, as at *i*, and the support-wire simply hooked in the indent. The other end of the support is fastened to the spring D in a similar manner. It is essential that the support-wire be formed out of material so that it can be properly insulated from electrical connection between the point *i* and the point G. When a metal wire is used, all that is necessary is to coat the end of the wire with glass, so that a glass-coated hook is formed, as at G. This will prevent any abnormal action to the lamp.

The operation of the cut-out may be stated as follows: The electric circuit normally is through the terminals P and N and through the filament F. The spring D and the bend C simply act as terminals for the cut-out device. The filament upon rupture, as at R, allows the spring to come into contact and engage with the bend C, through the action of the spring D, in overcoming the opposing force of the broken filament, thus causing the current to be diverted from its normal path through the filament, and thereby maintain-

ing a closed circuit without in any way affecting the remainder of the lamps that may be located in the circuit.

It is obvious that this device will operate as well and as certainly with only one lamp in the circuit as it would with any number of lamps.

I do not limit myself to any particular shape or size of filament to which the device is fitted, as it may be readily adapted to operate with almost any form of filament without departing from the spirit of the invention. The invention, however, is particularly adapted to the low-volt form of series lamp, where five to ten or twelve ampères current is used, such filaments being very strong and well adapted to withstand the slight strain that the spring contact-piece D may incur upon them. It is not necessary to provide a spring contact-piece of very large cross-section, four thousand ampères per square inch being sufficient for all ordinary purposes.

What I claim as my invention is as follows:

1. A cut-out for an incandescent electric lamp, consisting in a resilient conducting-body supported by the filament and placed between and electrically fastened to one of the terminals of the lamp and adapted to make electrical connection with the other terminal upon rupture of the filament, substantially as shown and described.

2. A cut-out for an incandescent lamp, consisting in a spring-conductor fastened to one of the terminals of the lamp and prevented from making electrical contact with the other terminal by an insulated supporting-body attached to the said spring-conductor and also to the filament, so that the filament will oppose the force of the said spring, substantially as described.

3. A cut-out for a series incandescent lamp, consisting in a spring contact-piece fastened to one terminal of the lamp and supported out of contact from the other terminal by an insulated body attached to the said spring and also to the filament and adapted upon rupture of the filament to overcome its opposing force and form an electrical contact with the other terminal of the said lamp, substantially as shown and described.

Signed at Hoosick, in the county of Rensselaer and State of New York, this 5th day of January, A. D. 1891.

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Witnesses:
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